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SOME VARIABLES IN COMPARATIVE PUBLIC SCHOOL ACCOUNTING

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Michigan Education Association

Bulletin No. 12.

Some Variables in Comparative Public School Cost Accounting

First Presented Before
Superintendents' and School Board Section
Michigan Education Association

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"The major cost variables are eight, representing the major accounting divisions. These are: Administration, Instruction, Operation, Maintenance, Coordinate Activities, Auxiliary Agencies, Fixed Charges, and Debt Service. Under each of these are a dozen or more minor variables which tend to make comparison difficult."

Moehlman
Public School Finance.

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E. T. Cameron, Secretary

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INTRODUCTION

THE EFFICIENCY of the public school is constantly subject to the appraisal of school executives, administrative officers, teachers, students, boards of education and by the general public. If the schools of the nation are to serve their purpose as institutions of democracy such appraisal is necessary and desirable. To be effective, however, such appraisal should be continuous and should be based upon carefully determined evidence and methods of procedure. The factors used in comparisons must first be comparable. There must also be a clear understanding of the needs and of the objectives of public school education. A definite technique of appraisal must be established to fit the various levels upon which such appraisal is made.

Forty years ago the percentage of attendance was accepted as evidence of the efficiency of a school system. It was assumed that if children could be gotten into school and kept there that the methods of the educational process could be relied upon to produce the results desired. Therefore the cold statement of a high attendance percentage was generally accepted as indisputable evidence of efficiency.

Within the past few years another method of measuring efficiency has been quite widely accepted, that of comparative costs. This method arose with the modern cost accounting systems set up in industry and was patterned to a large degree after this form of procedure. It was assumed that the situations in schools and industry were directly comparable.

The analogy between educational institutions and industry, however, is only partially true. A careful study of the situation shows that the same procedures employed in industry cannot be carried over into the educational field in toto. In the factory, money costs in the form of labor, raw materials, interest on investment, overhead, etc., are put into an enterprise. The product coming back to the investor is money (dividends). The efficiency of the organization is measured in terms of a product which is expressed in the same terms as the costs (money).

In education we invest money but we take out something vastly different. The product of education is character, personality, skills, and the abiding changes wrought in the child. The product of education is **not** a dividend in money.

It seems evident, therefore, that any adequate means of appraisal in education must be based upon a procedure which will take into account both the cost of education and the educational product.

There are three recognized means of determining educational costs:

1. On the basis of immediate or raw costs. These costs "represent the immediate cash outlay for current expense, improvements, and capital outlay expressed in terms of money expenditures or in units of such expenditures." Such costs do not consider outlay in relation to results.

2. Costs in terms of achievements as measured by objective tests. This method of determining costs is related to the immediate results of education.

3. Costs in relation to the ultimate results to the individual and to society. These results are expressed in terms of character, personality, vision, self-appraisal, self-direction, self-control, and co-operation.

It is the purpose of this report to indicate the futility of making any satisfactory appraisal of school systems on the basis of raw cost comparisons, without regard to what is "taken out" in the way of results. It is further the purpose of this paper to draw attention to the necessity of studying the results of the educational process, both immediate and ultimate, in terms of cost expenditures. The ever mounting demands for money in school districts make it imperative that school executives themselves devote considerable time and energy to a complete analysis of the costs within their own system in the interest of achieving all the economy possible.

School men themselves realize that they must take the lead in this important matter. This report attempts to furnish information which will assist in the recogntion of the numerous variables involved and therefore make possible a clearer understanding of actual costs.

Furthermore this report should stimulate educational research to develop and to make available techniques for adequate appraisal of the results of education both immediate and ultimate so that costs may be measured in terms of the product.

Suppose that Mr. A inquires of Mr. B how much it costs him to operate his car per year and receives an estimate of $400. "What!" Mr. A exclaims, "you are paying too much. My car expenses cost me only $225." "What kind of a car do you drive?" counters Mr. B. "What distance do you travel? What type of roads do you travel on? How old is your car? What kind of service and maintenance do you provide for it? What kind of driving comfort do you demand?" It is evident that no adequate comparison can be made of such costs without attention to the **variables** which enter into such comparisons and without a measure of the **results in terms of the service rendered.**

The practice of basing the appraisal of school systems on raw costs without regard to the variables involved is unsound in principle and unfair in practice.

Raw cost comparisons such as have been compiled and presented in the past on the basis of tax rates and per capita costs assume **equal** valuation, **equal** needs, **equal** efficiency, **equal** personnel, **equal** service, and **equal** products. It is assumed that "we are all doing very much the same job" although measured results indicate a range of at least 500% in immediate educational results between systems on specific items.

It is a fundamental law of scientific procedure that in any sound appraisal the investigator must take into account the possible variables entering into the problem and reduce comparison as far as possible to the **law of the single variable** if the conclusions are to have validity. The following statements of variables are not presumed to be exhaustive. The examples are selected from actual school data. The examples used may also contain other variables than the ones they are selected to illustrate. It is contended that a study of these variables with the examples given will assist administrators, board of education members and taxpayers to interpret more clearly school costs within their own schools. It is further expected that it will contribute toward the better understanding of the variables involved in intercommunity comparisons.

VARIABLE No. 1

The geographical size of a school district is the first variable in inter community comparison.

EXPLANATION:

Given two districts* with a school attendance of 10,000 each. If the area of one district were 10 square miles, while the area of the second was but 2 square miles, it would be possible in the latter case to erect fewer but larger buildings. This in turn would affect operation and maintenance costs as well as the instructional costs determined by the class size.

EXAMPLE:

District P with an average daily attendance of slightly more than 10,000 and an area of 20 square miles has 16 elementary schools while District B with an average daily attendance of slightly more than 10,000 and an area of approximately 2 square miles has but 6 elementary schools. The per capita cost to the taxpayer on average daily attendance is approximately $70.00 more in district P than in district B.

VARIABLE No. 2

The number of people to be served by a school district is a decided factor in determining comparative costs.

EXPLANATION:

One community may be compact and contain 20,000 children while another may be likewise compact and contain but 12,000 children. The selection of the two districts because they are of equal area and approximately the same population will not furnish equitable comparative costs unless the variable of numbers is considered. Other factors being equal the more pupils in a given area the less per capita cost.

EXAMPLE:

Districts A and B have approximately the same area but district B must serve 8,000 more pupils than district A. It happens that the per capita cost of the taxpayer based on average daily attendance is approximately $80.00 less in district B than in A.

VARIABLE No. 3

The distribution of children by ages is a dominant variable in educational services.

EXPLANATION:

Given two school districts with approximately the same number on the school census. One of these communities might be of the "mushroom" growth type with a large number of recently married residents. In this case the children would be predominantly young and would be in need of considerable educational facilities in the lower grades. A second community might have been long established and have its school population fairly well distributed by ages. This would merely mean that more children on the school census would be between the ages of 16 and 20 than in the first community. The educational needs and costs would vary greatly from those of the first district.

EXAMPLE:

Two communities entering this comparison should prepare an age distribution table and analyze it carefully to determine future educational demands.

* Note: Where "district" is used it refers to the area served by a specific Board of Education and is mutually exclusive of all other governmental costs than those of education.

VARIABLE No. 4

The nationality background of the school population is a factor in determining the type of educational service needed.

EXPLANATION:

If a community is composed of 30 or 40 nationalities in the first and second generation its educational problem is entirely different from that of a community having 8 or 10 nationalities in the third and fourth generation. In the first case there would be far greater demands for Americanization classes than would appear in the second. Furthermore in one community there might be a greater urge to secure more citizenship training than in a second community.

EXAMPLE:

District B is composed of slightly more than 40 nationalities while district R is practically homogeneous as far as nationality is concerned. District B has an extensive program of Americanization and appropriates nearly $35,000 a year while district R finds its program of adult education rather simple of solution and appropriates slightly more than $12,000 a year.

VARIABLE No. 5

The percent of pupils served in public and in non-public schools will vary budget school costs.

EXPLANATION:

If two school districts have the same number on the school census but in one community only 50% of the pupils attended the public schools while in the second community 80% attended the public schools, other things being equal, the per capita costs on the basis of population would show marked variations.

EXAMPLE:

District B has a school census of approximately 20,000 of which 11,000 or 55% are in the public schools while district A has but 12,000 on its school census of which 8,500 or 78% are in the public schools. District B would be expected to have a proportionately greater budget.

VARIABLE No. 6

In any inter-community comparison the index of purchasing power must be ascertained for each community involved.

EXPLANATION:

In any inter-community comparison the value of the dollar is of prime importance. The United States Government figures on the index of prices give a clue at once of how to control this variable.

EXAMPLE:

The Bureau of Labor Statistics, Bulletin No. 495, states that sirloin steak sold in Detroit on December 15th, 1928, for 50.1 cents per pound. At the same time the price in Houston, Texas, was 37.5 cents a pound while in Los Angeles, California, it was 45.5 cents a pound. In Manchester, New Hampshire, it was 62.4 cents a pound; in Portland, Maine, it was 67.8 cents a pound; and in Providence, Rhode Island, it was 80.4 cents a pound.

VARIABLE No. 7

The ratio of assessed valuation to "true valuation" may vary to such an extent between two districts as to make comparison impractical unless the exact ratios are known.

EXPLANATION:

This variable is a source of many false conclusions on tax rates. Other factors remaining constant, it is evident that the nearer assessed valuation is to true valuation, the lower will be the tax rate. The raising of valuations is a trick sometimes employed to lower the rate ("lower taxes") although the actual total amount of money raised is often larger. The ratio of assessed to "true valuation" sometimes varies materially between districts.

EXAMPLE:

Two districts, Y and Z, have the same school tax rate, e.g. $10.00 per thousand. District Y is assessed at 54% of the true value. District Z is assessed at 87% of the true value. If both districts were assessed on the basis of 100% valuation their respective rates would be $5.40 and $8.70. District Z is actually paying $3.30 more per thousand for educational service.

VARIABLE No. 7A

The per capita wealth is a prominent variable in inter-district comparison.

EXPLANATION:

Two districts might have approximately the same school census. In one district the amount of valuation might be very much larger than that of the second district. Unless the tax rates were in corresponding proportions one district would have very much more money per capita with which to conduct its schools.

EXAMPLE:

District F and District W have approximately the same school census. District F has a valuation of approximately $218,000,000 and a tax rate of $9.365 while District W has a valuation of but $48,000,000 and a tax rate of $11.88. Therefore District F has approximately three and a half times as much money per capita of school census as District W.* Hence no comparison can be made of the school tax rates in these districts without taking the amount of valuation into consideration.

VARIABLE No. 8

The age of a city has an important bearing on the type and amount of expenditures necessary to meet educational needs. This variable seriously affects comparisons of raw costs.

EXPLANATION:

The young, rapidly growing district has problems in administrative and instructional organization, adjustment of loads, housing problems, supply distributions, and site acquisitions which usually throw costs out of proportion to the city whose condition is static or nearly so. During the transitional stage of development the needs of the young community are not so clearly defined and understood, because they shift rapidly. Budgets are often exceeded, bond indebtedness is usually high with consequent high interest charges. Errors are made in educational designing because the true estimation of growth and development is difficult.

EXAMPLE:

District F and District W have practically the same number of students in membership. F is a very young community whose buildings have been erected within eight years. It has a bonded indebtedness of $6,153,000 and pays an interest charge of $288,136.25. District W has $1,559,335 bonded in-

* Note: If the wealth of these two districts were interchanged other things remaining as at present District F would have a tax rate of $42.55 while that of District W would be $2.59.

debtedness and pays $76,436.10 in interest. The effect on tax rates is evident.

VARIABLE No. 9

The costs of equal education service varies with the size of the system.

EXPLANATION:

Other things being equal, unit costs decrease as systems increase in size. Teaching, administrative, and operating loads are more easily distributed among personnel, the expensive small group and surplus service is eliminated.

EXAMPLE:

District G with a small high school and a median class size of 12.2 pays $170 per student in average membership for instruction alone. District W, a large system with a median class load of 25, pays $73.77 per student in average membership.

VARIABLE No. 10

Types of heating systems vary both in kind and in efficiency within the same district and between districts. Direct comparison of heating costs without regard to this variable are impractical.

EXPLANATION:

The efficiency of certain heating systems varies as much as 300 per cent within the same school system due to type of system and efficiency of operation. No adequate comparison of school operating costs can be made unless the effect of these variables is clearly understood. The complexity of the problem makes comparison difficult.

EXAMPLE:

Three elementary schools of approximately the same age and construction and hours of service gave the following figures: Building A—Oil burner—$7.50 per 1,000 cubic feet of heating space from July 1 to June 30. Building B—Hot Blast furnace—burning coal—$4.55 per 1,000 cubic feet for the same period. Building C—Split System—low pressure boilers—burning coal of same grade as above—$1.80 per 1,000 cubic feet for the same period.

VARIABLE No. 11

Methods used in firing cause wide variations in operating costs.

EXPLANATION:

Stoker firing on boilers is estimated to be from 15 to 50 per cent more efficient than hand firing. In the same manner hand firing may vary between various personnel as much as 25%. Poor firing methods therefore greatly increase the cost of operation in certain buildings and in whole school systems.

EXAMPLE:

School I consumes 780 tons of coal during the year at an annual cost $4,446.00 by careful hand firing. Poor hand firing might result in an annual cost on the same basis of $5,557—a waste of over $1,100. The same firing on a guaranteed stoker, saving basis of 15% would cost $3,779.00. (Note that this latter figure is hypothetical.)

VARIABLE No. 12

The procedure employed in the selection and purchase of fuel produces wide variations in the efficiency of plant operation.

EXPLANATION:

Wide methods of determining what coal shall be purchased are employed by Board of Education executives. These vary all the way from the acceptance of the lowest price bid from any dealer on any kind of coal, to purchase according to definite standards. These include analysis, quality best suited for the boilers in use as determined by test, and delivery which insures weight. Many schools are using coal entirely unsuited to the heating plant. Such procedure directly affects tax rates and directly as well as indirectly affects instructional efficiency.

EXAMPLE:

District W under one administration purchased annually for one building 80 tons of steam lump coal at $8.50 per ton. After being annexed to a larger community, the coal records show that not to exceed 50 tons of a carefully selected steam lump coal have been consumed annually at a cost of $5.65 per ton, an annual saving of $228 per year or 33%.

VARIABLE No. 13

The use or absence of automatic thermostatic and damper controls directly affects fuel costs.

EXPLANATION:

Some school systems use no automatic thermostatic or damper controls but leave the regulation of temperatures to the judgment of the engineer. Such practices lead almost invariably to irregularity in room temperatures and waste of fuel consumption. Other systems install automatic controls which keep temperatures within optimum working conditions.

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EXAMPLE:

Two buildings of similar structure, size and use show widely different efficiency on coal consumption. Building A has a carefully adjusted thermostatic control system. The fuel records show that normal temperatures are maintained at a cost of $1.75 per 1,000 cubic feet of space over a period of 12 months. Building B with manual control of heating costs $4.35 per 1,000 cubic feet. Recording thermographs in building B show a range during the session of 65 to 82 degrees. The actual cost in money is probably small in comparison with the reduction in instructional efficiency accompanying these high temperatures.

VARIABLE No. 14

The practice of charging the cost of water, light or power to the Board of Education in some communities and to the municipal government in others affects cost comparisons.

EXPLANATION:

Some municipalities furnish schools with water, light, or power without charge. Where this is done the cost of these items appears in the city tax rate or is assumed by the departments of public works. In such cases school taxes are proportionally reduced.

EXAMPLE:

District A receives its entire water service from the local department of public works without charge. District B must pay more than $6,000 for this service. Inasmuch as the two districts are practically the same size it would be unfair to make a comparison on operation costs without a knowledge of the aforementioned arrangement.

VARIABLE No. 15

The length of the school day, orientation of the building and the ratio of window to floor area are important variables in cost comparisons.

EXPLANATION:

The above items directly affect operating expenses. Length of day determines the number of hours heat must be supplied at a working temperature and the length of time ventilating fans need to be run. Buildings facing south have less heat losses, other things being equal, than those with north, east, or west orientation. The heat received from the sun relieves the load on the heating plant during the cold season. In the same manner buildings with a low light ratio make larger demands for artificial light than those with a large window ratio.

EXAMPLE:

During a period from November 1 to March 1, building J facing north with window ratio of 1 to 7 showed 50% more artificial light hours than building B facing south with a light ratio of 1 to 5.

VARIABLE No. 16

Variation in the policy of the percentage of air re-circulated makes heating costs vary over a wide range between schools and school systems.

EXPLANATION:

Certain commercial firms dealing with apparatus designed to re-habilitate used air, base their argument for saving on a guarantee of 50% in tonnage as a result of re-circulation of air within the building. While the efficiency of rehabilitation has not been proved, the reduction in cost due to re-circulation has been established beyond question. Large savings may be effected through this procedure. The influence of such procedure on health has not yet been determined.

EXAMPLE:

Certain school operating engineers re-circulate practically all of the air in winter weather, saving both fuel and labor. Other plants use a one-way movement system by which fresh air is admitted, heated and driven directly through the rooms and out through the roof vents. The latter is a very expensive type of operation and adds materially to operating costs and hence to tax rates.

VARIABLE No. 17

The efficiency of operating and maintenance personnel affects school cost comparisons.

EXPLANATION:

The efficiency of operating and maintenance personnel varies with the basis of selection, wage scale, training in service, age, habits of work and living, allotment of work units, and types of supplies furnished. Ordinarily where selection is based on political, personal, or other basis, except that of efficiency of service, the costs of operation and maintenance mount and the efficiency of service declines.

EXAMPLE:

District M has a janitorial force made up almost wholly of former members of a police department who were discharged by a new political regime. These men were given "good jobs" by the Board of Education whose members happened to be of the same political party as the ex-police. These men received an average salary of $170 per month. District W has a janitorial force made up of men selected on the basis of efficiency and their contribution to the instructional process. These men are paid an average salary of $135.00 per month.

The two districts are within six miles of each other and conditions of living and standards of service required are about equal. The quality of service obtained in District M is rated as poor in comparison with that of District W.

VARIABLE No. 18

Age and type of building structure affects maintenance and operating costs.

EXPLANATION:

The amount of labor necessary to operate and maintain buildings varies with the age and type of materials used in construction. The older type of buildings were constructed of materials upon which little experimental data were available to determine the suitability of such materials for the needs of instruction. This is particularly true of floors, walls, dadoes, windows, and roofs. It is not uncommon to find floors today which require 500% more labor to maintain them in the same condition as do certain other floors. A city with a large number of old buildings must allow larger maintenance and operating items in the budget than a city with well designed and constructed modern buildings.

EXAMPLE:

District W has classified its buildings as A, B, C, and D, on the basis of determined cost of operation. The schedule for each employee is made up of building units of 100 square feet and ground units of 2,000 square feet. Units in Class A buildings are allotted 42 cents per month each. Class B buildings are allowed 48 cents per month. Class C buildings 54 cents and Class D 58 cents. It is evident that if all buildings were of the Class A type operating costs could be reduced considerably.

VARIABLE No. 19

The policy of maintenance followed varies between districts.

EXPLANATION:

Maintenance costs vary greatly with the policy of the Board of Education. Maintenance items are usually among the first to be "lopped off" in a budget review. When this policy is followed, costs mount rapidly. Where a small expenditure would be sufficient to keep building and equipment at high efficiency if cared for at the moment when loss of efficiency begins, large amounts must be spent later to repair accumulated damages. Again a policy of maintenance may require the use of initially cheap materials. This policy is usually expensive in the long run and adds to general costs.

EXPLANATION:

District W used a good grade of paint on its corridor dadoes. This material required cleaning weekly and repainting in most places every year or two years. Five years ago lacquer was employed for this purpose. The dadoes are still in excellent condition. Cleaning has been reduced to a five-month period and maintenance and operating costs have been reduced 80%.

VARIABLE No. 20

The policy of school plant alteration affects school costs.

EXPLANATION:

Some Boards of Education have well established policies for alteration of buildings to meet changing instructional and operating needs. Such policies in the long run make for instructional efficiency and often materially reduce instructional and operating costs.

EXAMPLE:

Building W was constructed of loose fitting sash which allowed large heat losses. The sash was fitted closely and weather stripping was installed at a cost of $400.00. Coal consumption was reduced 10% annually.

VARIABLE No. 21

The rehabilitation of obsolete school plants may effect considerable savings in school costs while an opposite policy may greatly increase school expenditures.

EXPLANATION:

Many old buildings show evidence of excellent construction and although obsolete might through rehabilitation be made serviceable for many years to come. This practice may save large sums of money to a district which otherwise would require replacement with new buildings.

EXAMPLE:

District B was confronted with the problem of an old building which was obsolete and a menace to life and health. Careful estimates on a new building showed the cost of a suitable building including architects fees, educational planning, inspection, and equipment to be $350,000. A study of the old building showed that through proper remodeling a modern structure could be obtained at considerable saving to the district. This was effected at a total cost of $140,508 including architect's fees, educational planning, inspection and equipment. The resulting saving to the district was $209,402.

VARIABLE No. 22

The policy of posting various charges in the ledger will vary from district to district and will affect cost distribution comparisons between districts.

EXPLANATION:

In Variable No. 21 an outlay of $140,000 was made for rehabilitating an old school building. This was charged as capital outlay, while technically it should have been listed in the maintenance appropriation of current expense. This would have served to augment the maintenance cost during that specific year and change the various percentages allotted to the eight major accounting divisions.

VARIABLE No. 23

Policies regarding the extent of educational supplies and text books furnished cause variations in cost comparisons.

EXPLANATION:

A wide variation is found among school systems regarding supplies for instructional purposes. Some districts furnish no free texts and a minimum of instructional supplies. Others furnish all texts free and all the instructional supplies required by the students. While the furnishing of all supplies and texts is directly in harmony with modern education and results in actual economy to the district as a whole, the tax rate of necessity must show the effects of this item.

EXAMPLE:

District B furnishes all essential supplies and equipment free of charge to its students. In the elementary division grades 1 to 6, the cost of these supplies is nearly $4.00 per child in average daily attendance. For 6,000 pupils in District B this would mean $24,000 for elementary supplies. District Z has no such policy and therefore the Board of Education supply costs for its 6,000 pupils would be nothing.

VARIABLE No. 24

The policy of class size adopted by the Board of Education is an important variable.

EXPLANATION:

The policy of class size has a marked effect upon tax rates. In actual practices, classes vary all the way from 2 to 60. Sometimes this condition exists under a regular established policy while in others it is the result of a lack of policy. It is evident from the standpoint of cost and one class of 10 costs approximately three times as much for instruction as one class of 30. No positive educational evidence of an experimental character has settled the problem of class size as yet. The trend of such evidence however, is in the direction of larger groups and we may well expect to see the school of the future with groups considerably larger than those at present.

EXAMPLE:

District F has no policy of class size. District W has an adopted policy of 45 in the elementary school, 35 in junior high school and 30 in senior high school. District F actually has an average class size of 14.6 in junior and senior high school and 30 in the elementary school. District W closely approximates the policy set by the Board of Education. Other things being equal, student hour costs should be higher in District F than in District W.

VARIABLE No. 25

The breadth of educational service varies greatly between districts.

EXPLANATION:

The policy of educational service adopted by the Board of Education has an important bearing on tax rates. One district may have a wide health service with visiting nurses and teachers, clinics, school physicians and dentists paid for out of the funds of the Board of Education. Another district may have practically all of this service, if it exists, paid for out of agencies outside of the school.

EXAMPLE:

District F has approximately the same school membership as District W. District F paid $22,200 in health service in 1928. District W paid $5,000 in this service.

VARIABLE No. 26

The breadth of the curriculum offered may vary between wide limits in two districts.

EXPLANATION:

One district may offer the meager requirements of the core subjects in the elementary school and college entrance subjects only in the high school. Another district realizes that the public school exists for the development of all types of students so that they may live successfully in a democracy and offers a wide range of industrial subjects, vocational activities, home making, fine arts, social training, and economic guidance to its students. The expense of academic training in the first case is less than the socialized training offered in the latter. The actual costs may be compared only in terms of the changes effected in the students and not on the basis of raw cost comparisons.

VARIABLE No. 27

The length of the school day and of the school year varies between communities.

EXPLANATION:

The policies of Boards of Education vary largely with regard to the total time given to educational service both in length of day and length of school year. Other things being equal, it is reasonable to expect that the actual effect of this service is in proportion to the time spent. Raw cost comparisons must take into account the length of service rendered.

EXAMPLE:

District W offers an elementary day of 360 minutes, a high school day of 450 minutes, and an evening school of 120 minutes. District W with about the same number of students offers an elementary day of 330 minutes, a high school day of 440 minutes and no evening school. Again District W offers a summer school through grades 5 to 12 of 8 weeks. District F offers summer school for 6 weeks through grades 5 to 10.

VARIABLE No. 28

The extent of organization plays an important part in school costs.

EXPLANATION:

The extent of organization plays an important part in school cost comparisons. Organization types vary over wide ranges. Some districts use the K-6-6 plan. Some use the K-6-3-3, the K-8-4, the 7-5, the K-6-4-4, or other combinations. Not all these plans are equally effective nor are costs equal.

EXAMPLE:

District B offers education to pre-school, kindergarten, elementary, high school, junior college, and special schools for blind and crippled children. District A offers kindergarten, elementary, and high school education. It pays tuition for junior college and special children in nearby city schools at considerable saving in its own total budget.

VARIABLE No. 29

The type of supervision used in a system affects both the quality of the product and the cost of service rendered.

EXPLANATION:

The policy of supervision varies greatly in different districts. Some of these depend entirely on a group of administrative supervisors who direct instruction more or less independently of each other. In other places, supervision is recognized as a creative activity in the hands of a group of directors of instruction to develop better means of procedure and with the administrative supervision in the hands of the building principals who see that the adopted course of study is carried out. Comparison of the effectiveness of either method cannot be made on the basis of raw costs but only on the basis of the measured product.

EXAMPLE:

District W has a system of supervision as outlined above consisting of the equivalent of four full time supervisors of creative instruction. District F has 15 full time personnel devoted to general supervision of the administrative type. Both districts have an equal number of students to be served.

VARIABLE No. 30

There are several types of salary schedules in each of which the underlying philosophy is different. Furthermore the distribution of the teachers on the schedule will vary.

EXPLANATION:

Some communities have a single salary schedule based on preparation, development, and merit while others have separate schedules for elementary and secondary teachers. In some cases the raises are allotted on subjective appraisal and may be any one of four amounts as $50, $100, $150, or $200. In some cases raises are a matter of personal heckling. A position-automatic schedule is ordinarily more expensive and less efficient than the preparation-merit-development schedule. A second factor is the position of the staff on the schedule. Two communities may have the same type of schedule but in one the group may be just starting on the schedule while in the second the schedule may have been in operation for a period of years.

Mention should be made of the fact that one community may be utilizing the Law of Wages (Moore) which is correlated with the index of purchasing power. A second community may have established arbitrarily a schedule which is entirely unsound economically, with the result that teaching efficiency and morale are greatly jeopardized.

EXAMPLE:

Districts A and B are of the same size and have approximately the same number of pupils. A has a position schedule while B has a preparation-merit-development schedule. In A the maximum for elementary teachers is $2,400 while in B it is $2,800. The secondary maximum is identical but in district A the average salaries are greater than those in B because the teachers in district A are nearer their maximums. The schedule has been in effect longer. In district A the average elementary teacher's salary is $2,051 while in B it is but $1,892.

VARIABLE No. 31

There are varying policies of substitute service.

EXPLANATION:

Some communities allow five days' sick leave with full pay and five additional days with half pay. Some allow ten days with full pay while some allow ten days with full pay and demand the teachers pay for the substitutes.

Some schools appropriate a blanket sum of money to be met by a like sum from the teachers with which group insurance is purchased for those who contribute. Costs of substitute service cannot be compared on an equitable basis until these variables are considered.

EXAMPLE:

District A allows twenty days for absence and appropriates $11,000 a year while district B allows but ten days and appropriates nearly $16,000, although A has nearly 100 more teachers than B. District B desires to cut the appropriation to $6,000 and proposes to buy group insurance, hence its own costs will be less than those of district A, for it will pay teachers nothing directly for absence but will pay the substitutes.

VARIABLE No. 32

The Library Service Policy of Boards of Education will not always synchronize.

EXPLANATION:

Libraries may be purely instructional within the school or they may serve as instructional and public as well. Where libraries are purely instructional the salaries of the teacher-librarians may be charged to instruction or they may be classed as an auxiliary agency. One district may buy more supplies and books than another. One district may decide to use fewer expert librarians and more clerical assistance. The policy of maintenance of library books will also vary the costs to a large degree.

EXAMPLE:

District A spends approximately $7,000 more for library salaries charged to Auxiliary Agencies than district B but in B the teacher-librarians are charged to instruction. A spends $3,000 less for books than B. B has a policy of buying through the libraries all text and reference books where five or more will be needed in any one building.

VARIABLE No. 33

Different communities have varying needs of pupil transportation.

EXPLANATION:

The presence of orthopedic children in a community will cause a special transportation problem which will be further aggravated by numbers. A community with a large area coupled with special traffic hazards will cause a greater need of pupil transportation than a small compact area with schools well placed so as to avoid these hazards.

EXAMPLE:

District A appropriates $2,000 for bus service for special children in centralized schools while district B utilizes but $1,850 for this same type of service. District R carries a pupil transportation appropriation of $125 charged to Senior High Instruction and also $1,707 for special class pupils charged under auxiliary agencies.

VARIABLE No. 34

Local conditions will make for different policies pertaining to public lunches.

EXPLANATION:

Congested industrial areas with varying economic conditions will make for different appropriations for public lunches. Some communities give milk free to elementary underweight children while others may find it necessary to furnish a complete lunch to open window or orthopedic children. In these latter cases pupils may or may not pay for a portion of the lunch.

EXAMPLE:

District A appropriates $5,200 for this service while district B allows $5,900. In district A children except indigents are fed at cost. In district B the entire lunch is free. District R carries budget appropriations as a lunch room deficit of $322.50.

VARIABLE No. 35

The amount of tuition paid by a school district is a variable. It may be charged as an auxiliary agency or against instruction.

EXPLANATION:

School districts not maintaining a high school must pay in Michigan $60 towards this tuition. They may pay the entire tuition bill of their residents. Other communities maintain high schools but do not operate special schools for deaf or blind owing to lack of numbers. In this case they may send their pupils to nearby metropolitan special schools. This augments their tuition and transportation (See No. 33). The question of junior college enters at this point. Some districts prefer to maintain their own junior colleges while others prefer to pay tuition of their high school graduates to nearby colleges. This

factor will cause great variations in the amount expended for this type of education—whether as tuition or as a definite instructional cost.

EXAMPLE:

District A chooses to pay tuition for sight saving and deaf classes but does not list these charges as auxiliary agencies. District B pays this tuition but places the charge as auxiliary agency. District A maintains its own junior college while district B prefers to pay tuition of its public secondary school graduates at a nearby municipal college.

VARIABLE No. 36

Different types of communities demand varying degrees of recreational service. Practices also vary as to whether districts, cities or both carry the cost of this service.

EXPLANATION:

In some districts a recreational commission under the auspices of the city government pays the entire cost of this service, while in other districts the Board of Education pays one-half the cost. Naturally there will be variations in the amount and type of service provided ranging from a small sandlot league to expensive outdoor swimming pools such as exist at Rouge Park in Detroit.

EXAMPLE:

District A pays one of the recreational costs and appropriates $15,192 while district B pays the entire costs and appropriates $16,000. District R allots $257.15 for pool operation, $3,000 for recreational service and $414.10 for supplies, or a total of $3,617.25.

VARIABLE No. 37

The method of determining school plant needs makes school costs vary greatly between communities.

EXPLANATION:

Some districts build school buildings on the basis of an architect's guess or estimate of its needs without regard to policy or educational plan. Such procedure is costly in the long run in actual money paid for buildings and in the indirect effects on instruction.

EXAMPLE:

District K decided to construct a school building at a cost of $1,500,000. Plans were drawn and everything was ready to begin. On second thought, an educational specialist was engaged to make a study of the plan, in terms of curricular needs. As a result $300,000 was cut from the original figure and a building suited to actual instructional needs was erected.

VARIABLE No. 38

The size of site will cause school costs to vary. The cost of keeping such sites in condition will vary maintenance and operation costs.

EXPLANATION:

There is little uniformity in site sizes in various districts. These vary from less than half a city block to twenty acres. It is evident that such variations in policy must be taken into account when comparison is made of school costs.

VARIABLE No. 39

The assumption of debt service costs varies between districts.

EXPLANATION:

If a school district has financial autonomy it will probably carry educational debt service as a part of its own budget while a district having fiscal dependence will probably have such assumption carried in the regular municipal budget as a direct obligation. Of course in either case the community absorbs the entire cost but unless this fact is understood the inter district comparison of school costs would be decidedly misleading.

EXAMPLE:

Districts A and B assume their own debt service while in district D the city itself assumes the costs. In district R there is an appropriation in the educational fund of $91,623.16 for debt service and also an appropriation of $138,962.91 in the building fund for this service.

VARIABLE No. 40

The type of bonds used in debt service will vary school costs.

EXPLANATION:

The four methods of borrowing money on bonds are straight long term, the long term (sinking fund), the serial bond and the short term note. The first method is considered obsolete while the second is in considerable favor. Money borrowed on long term notes is finally to be returned by the sinking fund built up by annual payments. The serial bond eliminates certain dangers of the sinking fund method. School costs will vary according to the method in use.

EXAMPLE:

In "Public School Finance" it is shown that 4% 25 year straight bonds cost $2.00 for every $1.00 borrowed while serial bonds would cost but $1.60. Manifestly a study of debt service should include an analysis of the method of borrowing and repayment.

VARIABLE No. 41

Some districts have no debt service because of a Pay-As-You-Go Policy.

EXPLANATION:

Where a district by reason of local growth conditions determines that it is wiser not to be encumbered by serial or long term bonds, the pay-as-you-go policy is adopted. Naturally while the current tax rate may be higher to meet this condition the debt service element has been eliminated. It is obvious that a study of comparative costs should be preceded by an analysis of the method of securing revenue so that a complete picture of the reason for various costs will be understood.

EXAMPLE:

District L reports a building program of one new building costing $283,000 together with a first unit of an elementary school and additions to two other elementary schools, but district L is on a pay-as-you-go basis and has no debt service. Manifestly its capital outlay might be the same as some other community contemplating the same expenses but the debt service of the two communities would vary greatly because of a different revenue policy. The tax rates in the two communities would differ considerably granted that the valuations were the same.

VARIABLE No. 42

The type of insurance will cause marked variations in the fixed charges account.

EXPLANATION:

Some communities desire to be their own insurers. This naturally lowers the fixed charges costs but in case of a fire would push up their replacement costs.

Some communities insure on an 80% co-insurance clause; others adopt a 90% clause while still others may take straight policies or do not insure at all.

Some districts are constantly seeking re-ratings from the state inspection bureau which seems both to reduce the fire hazard and the insurance rate. Some communities may carry boiler insurance. The type of boiler will vary the kind of insurance. Furthermore some systems may insure against explosions and cracking while others insure only against explosions. Some communities also carry tornado insurance.

EXAMPLE:

The Craig-Longman report shows District X to be insured for 116% of its estimated value of the entire school plant including sites, buildings and equipment, while district G has no insurance. Of the other ten districts in the list, the per cent of insurance carried varies from 1% to 84%.

VARIABLE No. 43

Some communities find it necessary to pay rent for additional school plant service.

EXPLANATION:

Some communities find it necessary to rent portables or other facilities to house their children. This raises the fixed charges costs but tends to lower the capital outlay. A complete analysis should be made to determine whether it is cheaper to pay rent than to build.

EXAMPLE:

District B pays $200 a month rent while district A pays no rent. District B recently reorganized its facilities and now pays but $100 a month. Within a year these will be eliminated but the capital cost will be greater as will the debt service, operation and maintenance. District M pays $6,866.93 a year for rent. District R carries $200 for rent but charges it to "Operation of Plant."

VARIABLE No. 44

Some communities find it necessary to pay a tax collection cost which augments their fixed charges costs.

EXPLANATION:

In some districts the law provides that the school district shall assume a cost of collection of its revenues. These are rightfully allotted to fixed charges and serve both to increase the entire budget and the revenue, for such an amount does not enhance the instructional process.

EXAMPLE:

The budget of district R in Illinois contains a collection cost of $25,275 on its educational fund and $8,425 on its building fund.

VARIABLE No. 45

The policy of various Boards pertaining to compensation will show marked differences.

EXPLANATION:

Boards of Education are accountable for accidents happening to their employees. They may elect to insure against this or to carry the charges directly when the accidents occur.

EXAMPLE:

District A allots $1,000 on the budget for this service while district B allotted $1,200 and had to overdraw this account. District R carries $1,100 as compensation insurance.

District X carries no budget appropriation nor compensation insurance.

VARIABLE No. 46

In general control the type of organization will cause the costs to vary.

EXPLANATION:

A school system may be organized on the unit, dual or multiple plan. Manifestly the cost for these will vary even if other factors have been equalized. One community may pay its school board members considerable money in salaries and have the treasurer handle most of the work while another community will have a legislative and appraisal board of education and secure the services of an accountant.

EXAMPLE:

District B carries a budget appropriation of $5,000 for salaries for board members. District R carries no such an appropriation.

VARIABLE No. 47

The analysis of what is charged to general control will show fluctuations in comparative costs.

EXPLANATION:

If one school district charges the chief engineer or superintendent of buildings and grounds to operation and another charges him to general control there will be a variation in the per cent of budget allotted to these funds. Where should an assistant superintendent in charge of instruction be charged? Where will one charge the director of the census and child accounting?

EXAMPLE:

District A spends 4.9 cents of its current expense budget dollar for general control while district B spends 7.8 cents. Baltimore, Maryland, spends 2.59 cents. District A charges superintendent of buildings to operation while district B charges him to general control.

In district A there is one assistant superintendent of schools in charge of business while the instructional supervision is cared for by heads of departments. District B has two assistant superintendents, both charged to general control.

In district B attendance employees are charged to co-ordinate activities while in district A general control pays for them. District B has a consultant charged to general control. District A has none. School elections cost $800 more in district B than in A. District R carries a budget appropriation of $5,019 for a printing department.

District B carries nearly $6,000 for public relations but charges pure printing back to ultimate use as supplies. District R permits considerable transportation of its personnel and charges it to general control. The total general control in district R is $36,834 while in district B it is nearly $80,000.

VARIABLE No. 48

Even with a standard child accounting system within the state various communities will obtain different results from the same set of rules.

EXPLANATION:

How shall average daily attendance be ascertained? If school is closed on Armistice Day afternoon how is the average daily attendance affected? If three days are allotted to examinations what entry will the attendance department place in C. A. 10* for the attendance on each of the three days? Where costs are to be ascertained on A. D. A. a uniform interpretation of rules must be made by the communities involved in compari son. This is likewise true of ascertaining registration membership and number of student hours in instruction.

VARIABLE No. 49

Finally—the most important variable in the entire educational process is the final product. No comparison is valid unless this factor is given due consideration.

EXPLANATION:

It has been estimated by the best educational authorities that the effectiveness of instruction between different teachers may vary from zero to at least 500 per cent. Since the instruction of the child is the primary purpose of all educational expenditures, it is evident that no adequate comparisons on expenses of education can be made except on the basis of actual changes effected in the child. This item is probably the largest single variable entering into cost comparisons. It is concerned with the actual products of education, the dividends to society. Scientific procedure is rapidly being developed to measure this product. Until this is effected no adequate comparisons can be made of any kind of school costs.

In conclusion the practice of executives and boards of education to justify school efficiency on the basis of low tax rates, or low per capita costs alone, without regard to the service rendered, is not only reprehensible but pernicious. Such practices cannot be justified in view of the objectives of modern education. The purpose of education is to develop an integrating personality;—to develop an individual so that he can live successfully in a democracy. Actual costs in education can be justified only in terms of the abiding changes effected in the child.

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*Michigan uniform child accounting blank—see state department regulations.

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